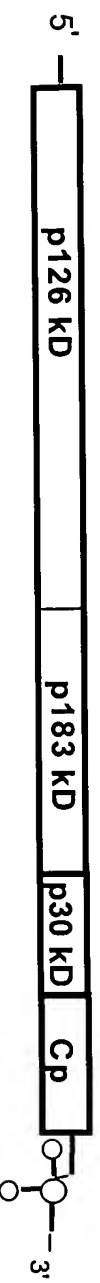


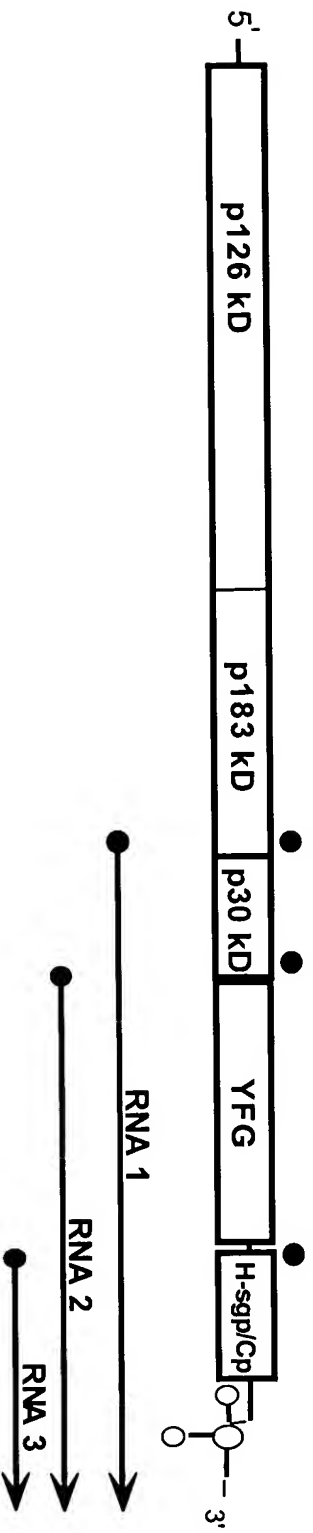
# FIG. 1

## Tobamovirus Expression Vectors

### TMV

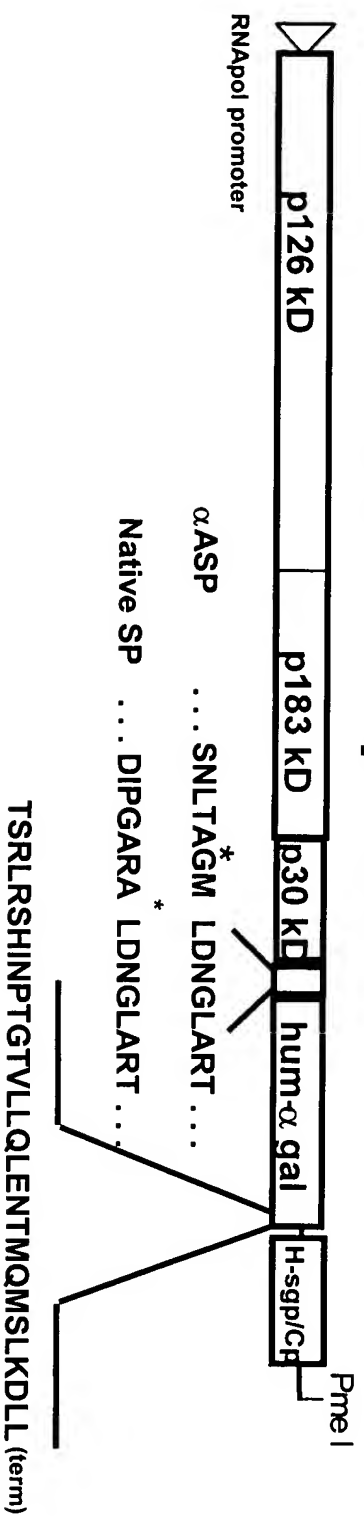


### TMV-Expression Vector



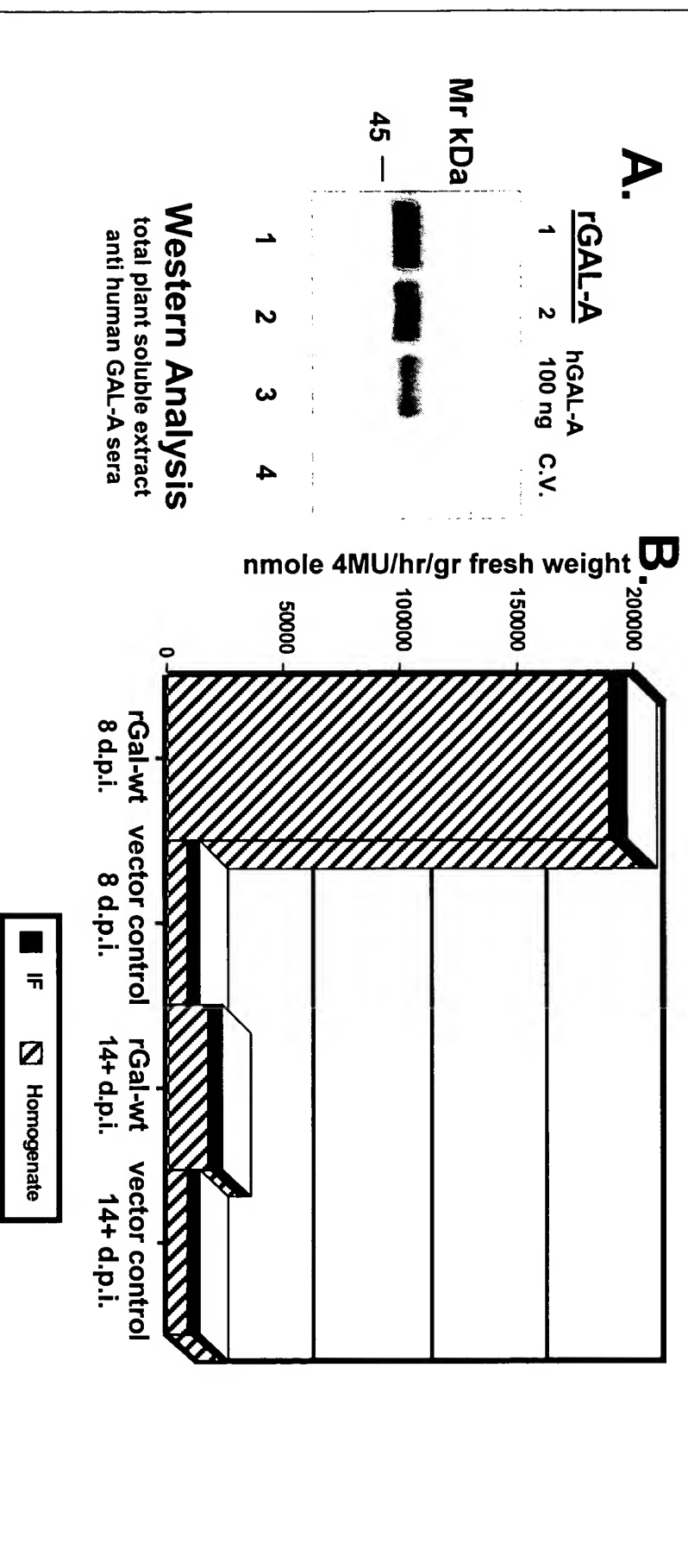
# FIG. 2

## Tobamovirus Vector for rGal-A Expression



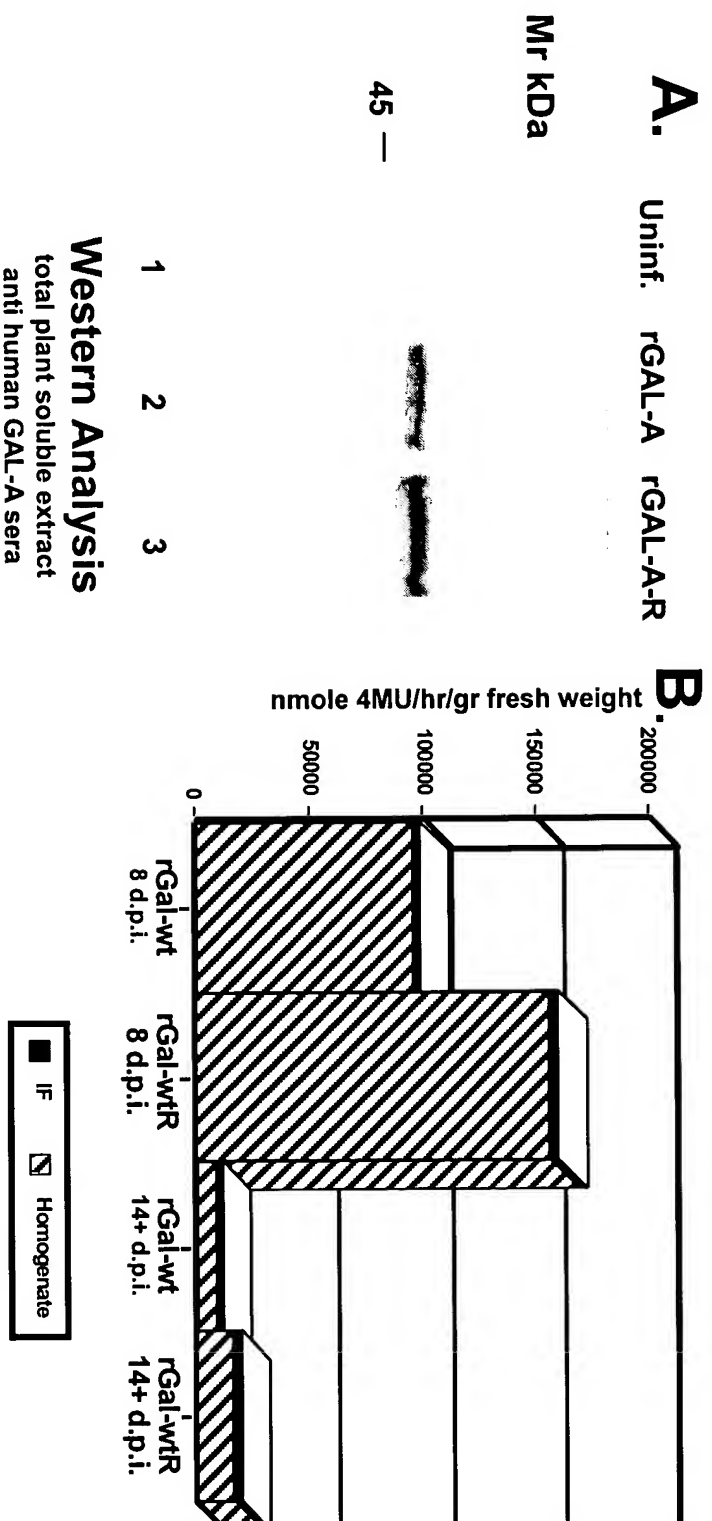
**FIG. 3**

# Accumulation and Activity of WT rGal-A



**FIG. 4**

# Accumulation and Activity of WT and ER-Targeted rGal-A



**FIG. 5**

**Carboxy-Modifications to rGal-A**

	-30	- 20	-10
WT	TSRLRSHINPTGTVLLQLENTMQMSLKDLL		
WTR	TSRLRSHINPTGTVLLQLENTMQMSLKDLLSEKDEL		
Δ4	TSRLRSHINPTGTVLLQLENTMQMSL		
Δ4R	TSRLRSHINPTGTVLLQLENTMQMSLSEKDEL		
Δ8	TSRLRSHINPTGTVLLQLENTM		
Δ8R	TSRLRSHINPTGTVLLQLENTMSEKDEL		
Δ12	TSRLRSHINPTGTVLLQ		
Δ12R	TSRLRSHINPTGTVLLQSEKDEL		
Δ25	TSRLR		
Δ25R	TSRLRSEKDEL		
Control virus (GFP, AMP, IFNγ)			

\* potential CTPP cleavage (Gene 58:177,1987) .

\* potential CTPP cleavage (Gene 58:177,1987) .

**FIG. 6**  
**Western Blot Analysis of**  
**Carboxy-modified rGal-A**

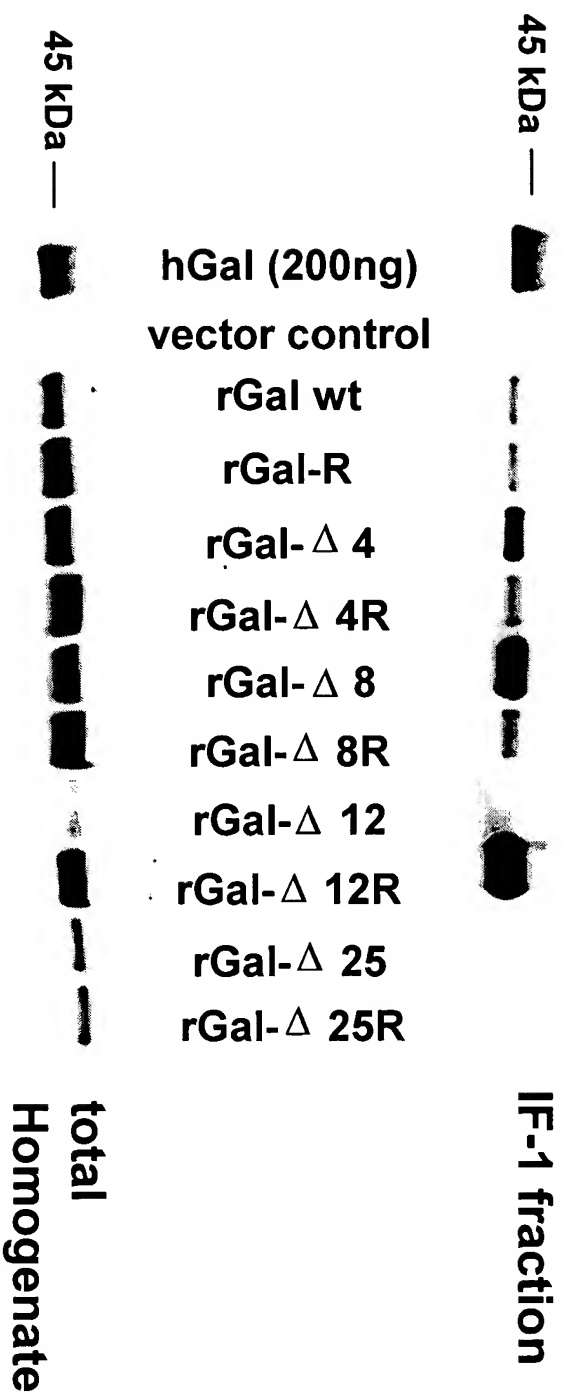
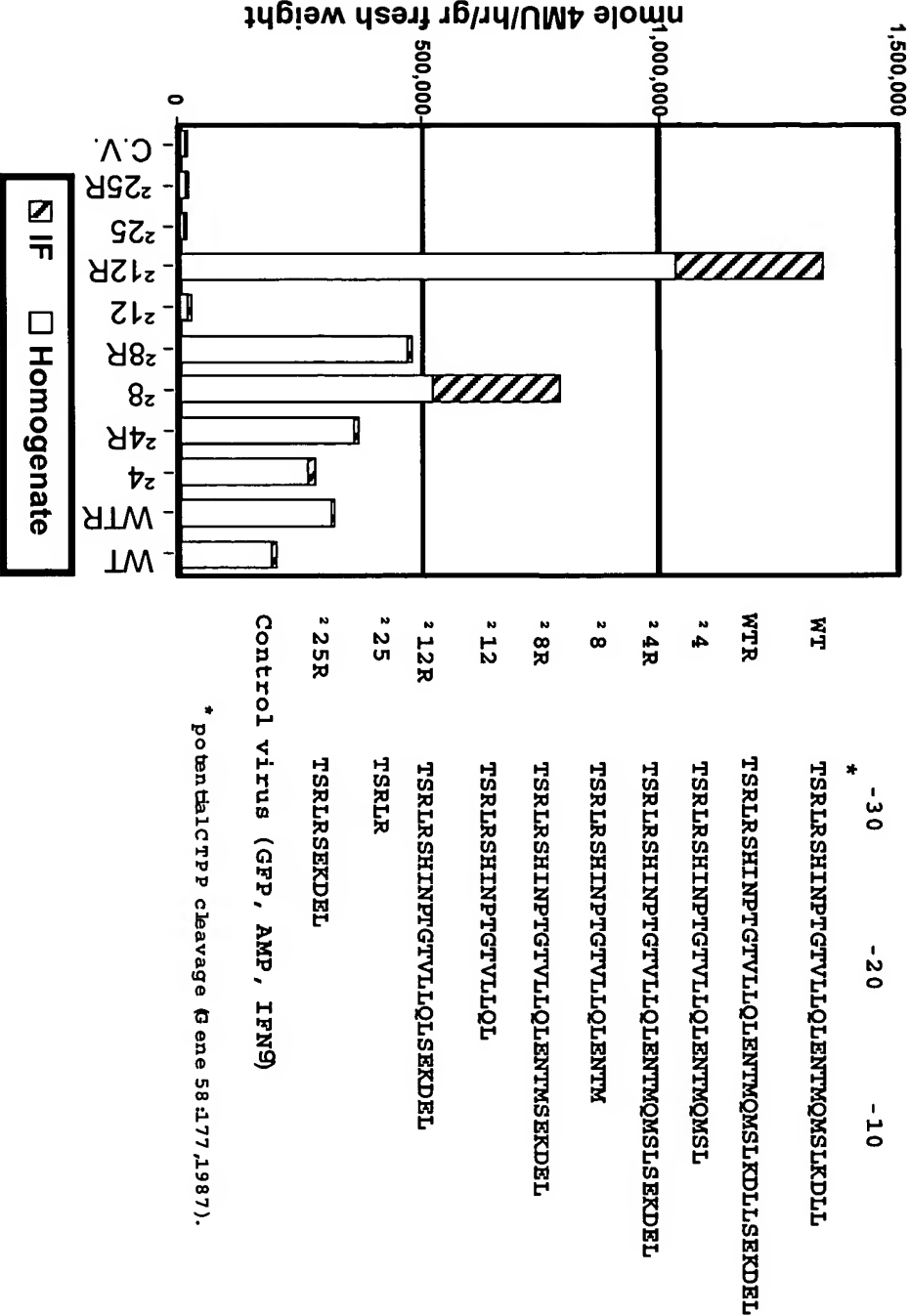


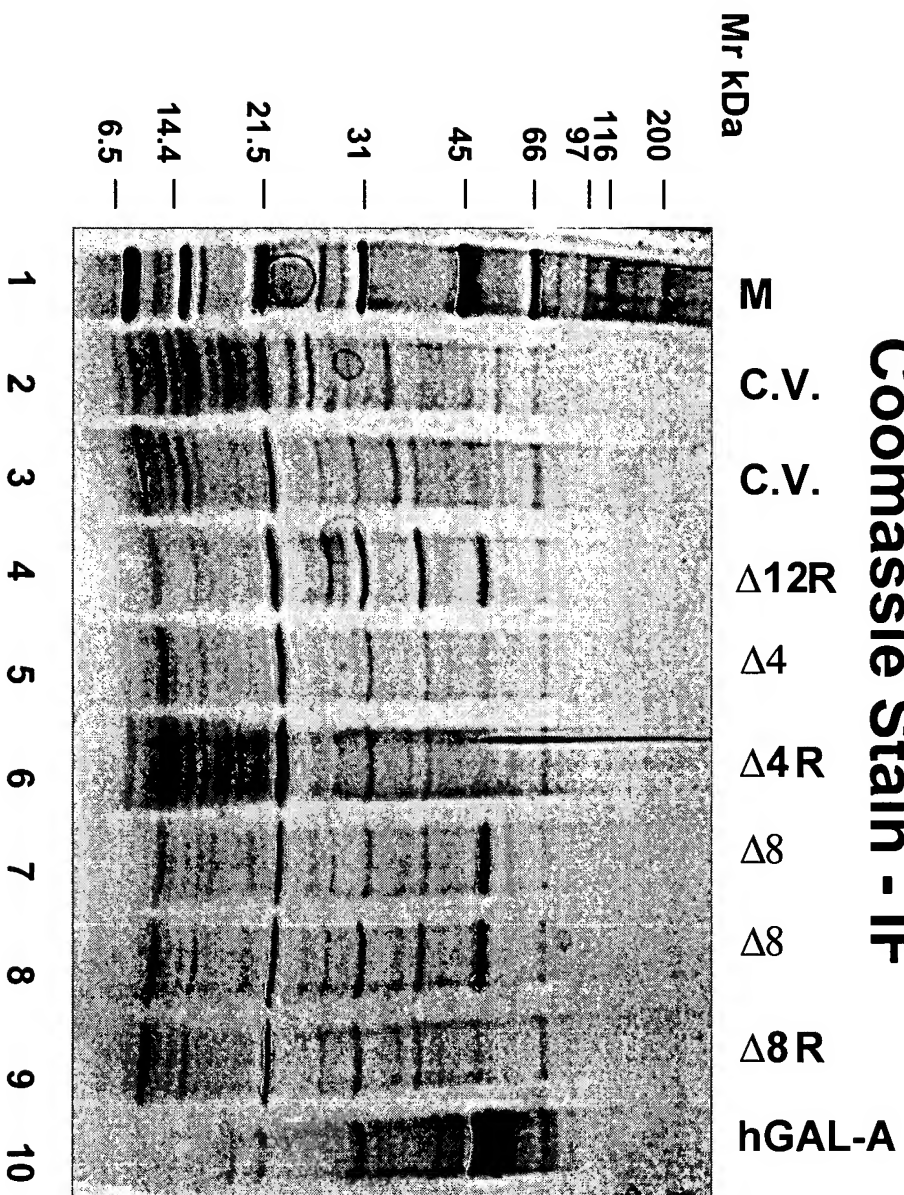
FIG. 7

Enzymatic Activity of Carboxy-Modified rGal-A



**FIG. 8**

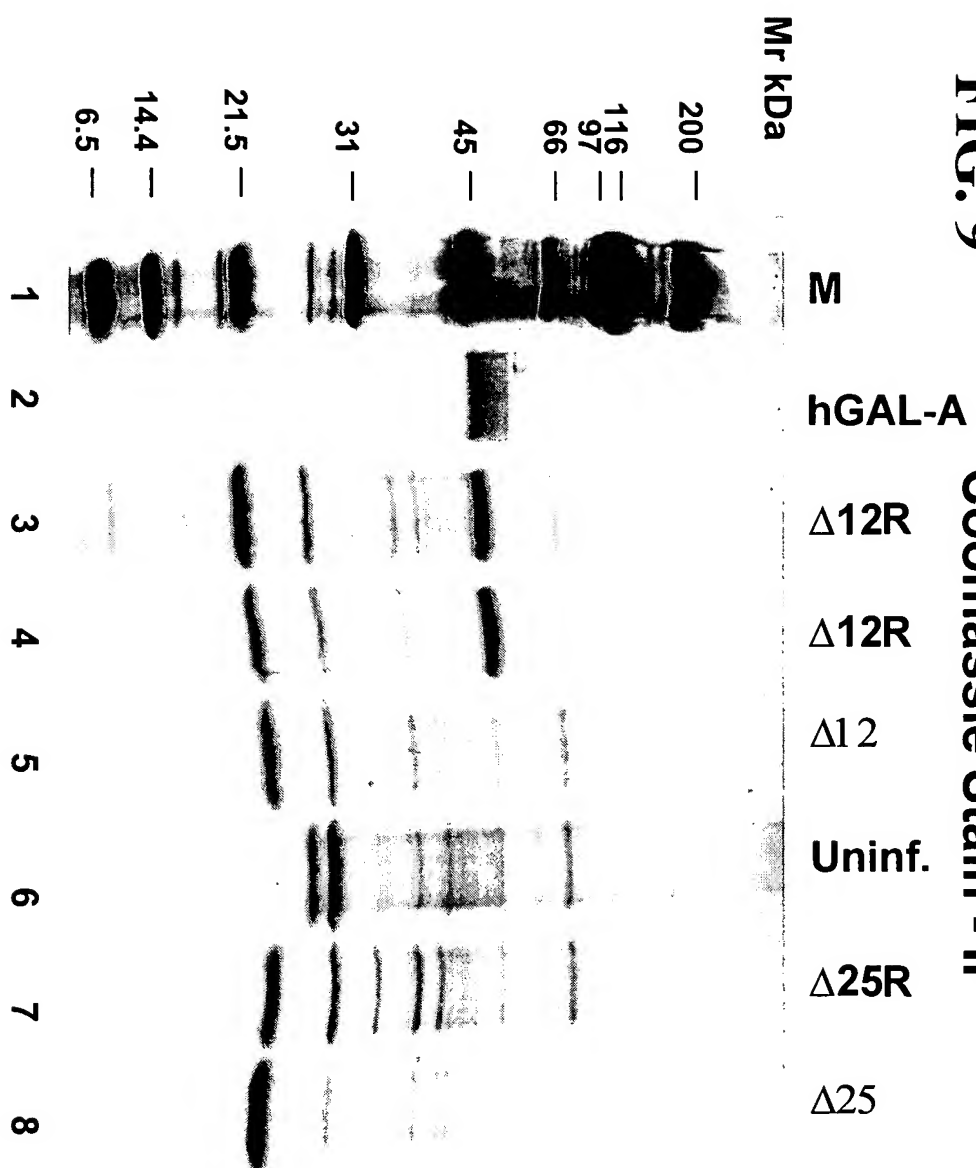
**Coomassie Stain - IF**





**FIG. 9**

**Coomassie Stain - IF**



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**FIG. 10**

**Schematic of rGal-A Secretion**

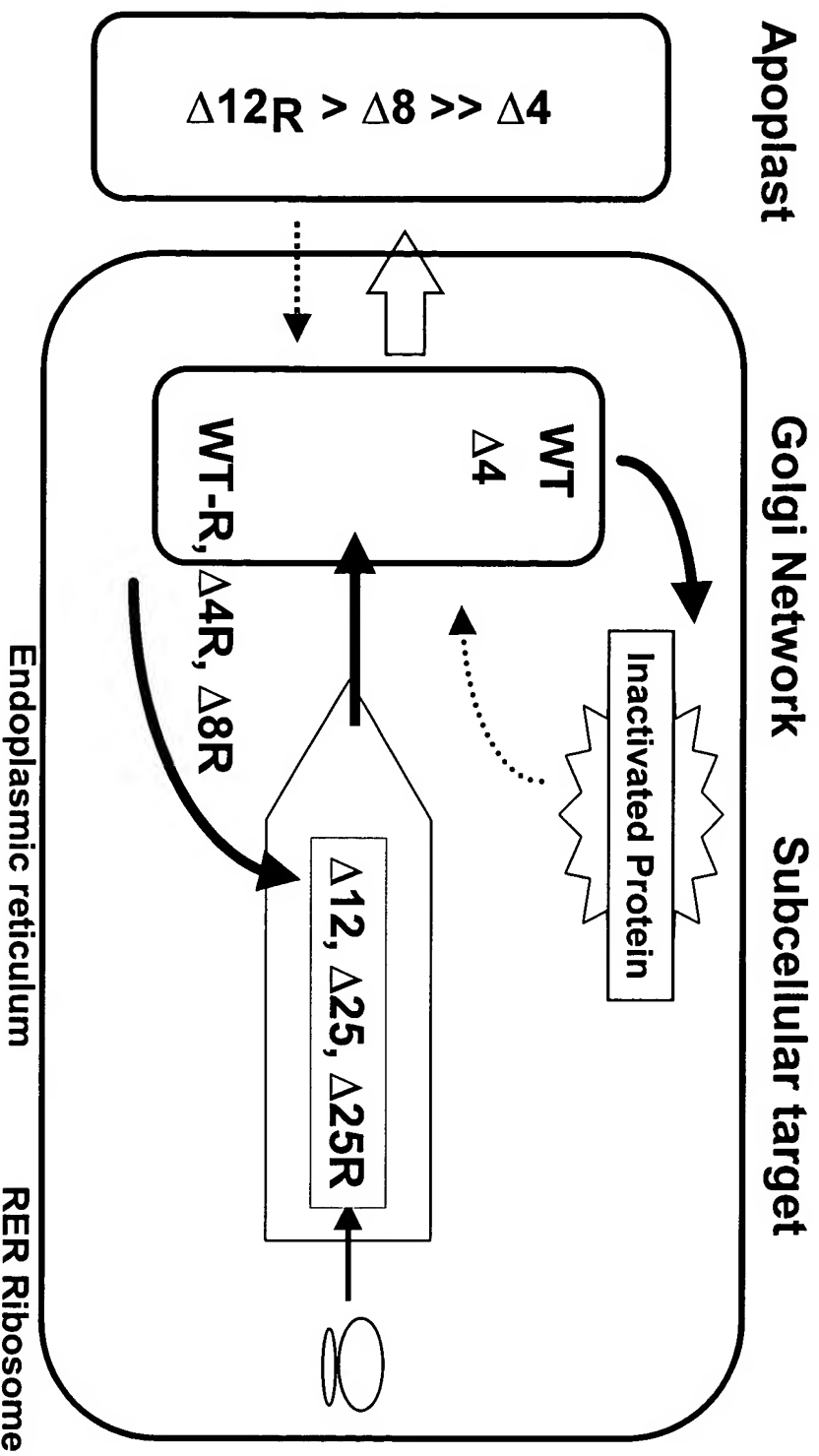
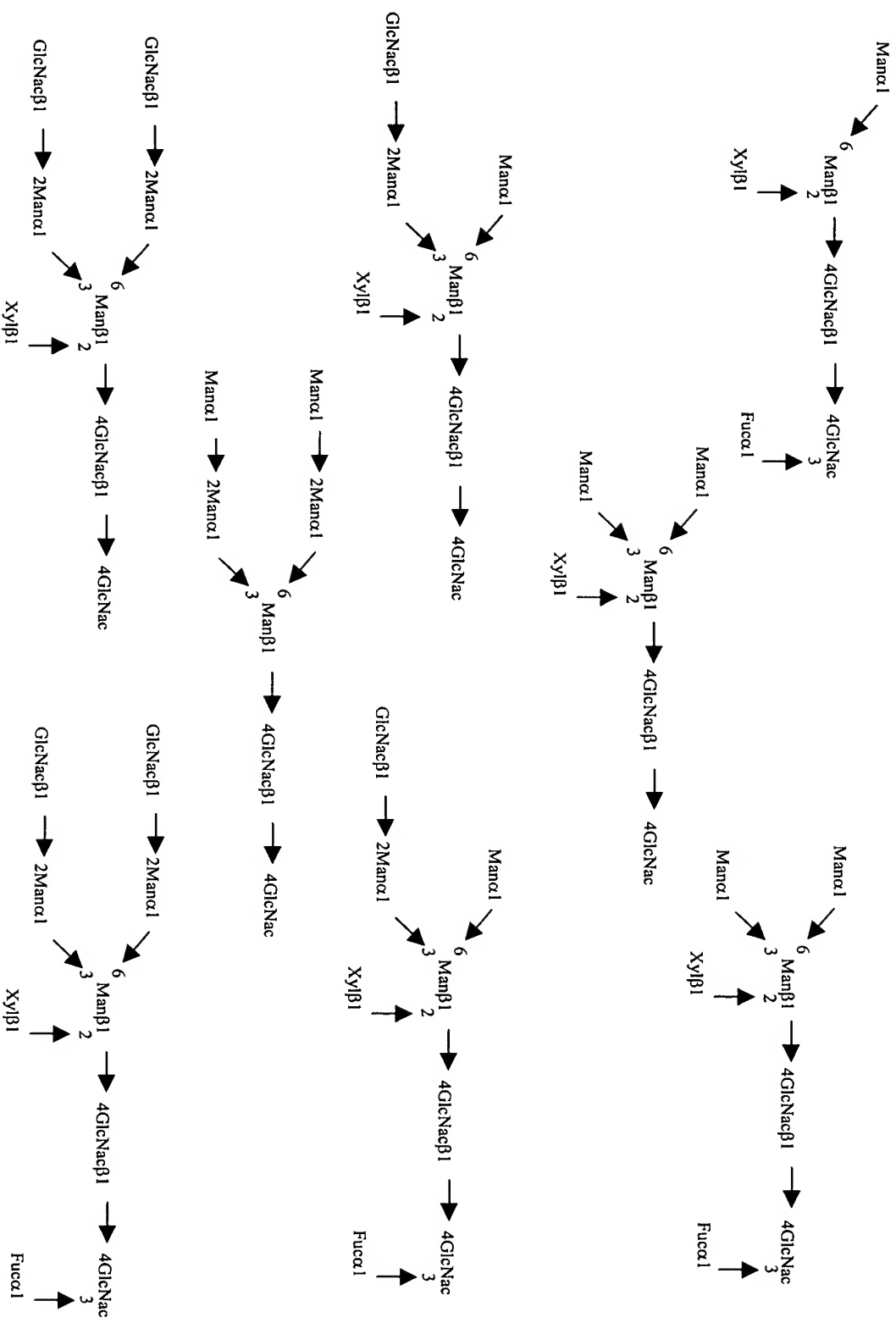


FIG. 11



## FIG. 12-1

GTATTTTACAACAATTACCAACAACAACAACAACAACATTACAATTACTATTTACAATTACAATGGCATAACACA  
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TTACGACACAGCGGTTGAAGAGTTTAAACGCTCGTGACCGCAGGCCCAAGGTGAACCTTTCAAAAGTAATAAGCGAGGAGC  
AGACGCTTATTGCTACCCGGGCGTATCCAGAATTCCAAATTACATTTTATAACACGCAAAATGCCGTGCATTGCTTGA  
GGTGGATTGCGATCTTTAGAACTGGAATATCTGATGATGCAAAATCCCTACGGATCATTGACTTATGACATAGGCGGGAA  
TTTTGCATCGCATCTGTTCAAGGGACGAGCATATGTACACTGCTGTATGCCAACCTGGACGTTTCGAGACATCATGCGGC  
ACGAAGGCCAGAAAGACAGTATTGAACTATACCTTTCTAGGCTAGAGAGAGGGGGGAAAACAGTCCCCAACTTCAAAAG  
GAAGCATTTCAGATACGACAGAAATTCCTGAAGACGCTGTCTGTCAAACTTTCCAGACAATGCGACATCAGCCGAT  
GCAGCAATCAGGCAGAGTGTATGCCATTGCGCTACACAGCATATATGACATACCAGCCGATGAGTTCCGGGCGGCACCT  
TGAGGAAAAATGTCCATACGTGCTATGCCGCTTTCCACTTCTCTGAGAACCTGCTTCTTGAAGATTATACGTCATTTG  
GACGAAATCAACGCGTGTGTTTTCGCGCGATGGAGACAAGTTGACCTTTTCTTTGTCATCAGAGAGTACTCTTAATTATTG  
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TTTTAGCTCAGCAGTTAATACCTGTTTGTAAAGTTTCTAGAATAGATACTTTCTTTTGTACAAAGGTCGGCCCAT  
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CATTAAACGGTGTGACAGCGAGGTCGAATGGGATGTGGACAAATCTTTGTTACAATCCTTGTCCATGACGTTTTACCTGC  
ATACTAAGCTTGCCGTTCTAAAGGATGACTTACTGATTAGCAAGTTTAGTCTCGGTTCCGAAACGGTGTGCCAGCATGTG  
TGGGATGAGATTTGCTGCGCTTTGGGAACGCATTTCCCTCCGTGAAAGAGAGGCTCTTGAACAGGAACTTATCAGAGT  
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CTGTGGACATGCCTGCGCTTACATTAGGAAGAAGATGGAAGAAACGGAAGTGTGTACAATGCATTTTACAGGTTATCG  
GTGTTAAGGAGTCTGACAAATTCGATGTTGATGTTTTTCCAGATGTGCCAATCTTTGGAAGTTGACCCATGACGGC  
AGCGAAGGTTATAGTCGCGGTCTAGAGCAATGAGAGCGGTCTGACTCTCACATTTGAACGACCTACTGAGGCGAATGTTG  
CGTAGCTTTACAGATCAAGAGAAGGCTTCAGAAGGTCTTTGGTAGTTACCTCAAGAGAAGTTGAAGAACCGTCCATG  
AAGGGTTTCGATGGCCAGAGGAGGTTACAATTAGCTGGTCTTGTGGAGATCATCCGGAGTCTGCTCTATTCTAAGAACGA  
GGAGATAGAGTCTTTAGAGCAGTTTCATATGGCAACGGCAGATTGTTAATTCGTAAGCAGATGAGCTCGATTGTGTACA  
CGGGTCCGATTAAAGTTCAGCAAAATGAAAACTTTATCGATAGCCTGGTAGCATCACTATCTGCTGCGGTGTCCAATCTC  
GTCAAGATCCTCAAGATACAGCTGCTATTGACCTTGAACCCGTCAAAGTTTGGAGTCTTGGATGTTGATCTAGGAA  
GTGGTTAATCAAACCAACGCCAAGAGTGTGATGCGGTGTTGTTGAACCCACGCGAGGAAGTATCATGTGCGCTTT  
TGGAATATGATGAGCAGGTTGTGGTGACATGCGATGATTGGAGAAGAGTAGCTGTGAGCTCTGAGTCTGTTGTTTATTCC  
GACATGGCGAACTCAGAACTCTGCGCAGACTGCTTCGAAACGAGAACCGCATGTGAGTAGCGCAAAGGTTGTTCTTGT  
GGCAGGAGTTCCGGGCTGTGGGAAACCAAGAAATCTTTCCAGGTTAATTTTGTGAAGATCTAATTTTAGTACCTG  
GGAAGCAAGCCGCGGAAATGATCAGAAGACGTGCGAATTCCTCAGGATTTAGTGGCCACGAAGGCAACGTTAAACCC  
GTTGATTCTTTCATGATGAATTTTGGGAAAGCACACGCTGTGAGTTCAGAGGTTATTCTTGTGAAGGGTTGATGTT  
GCATACTGGTGTGTTAATTTCTTGTGCGATGTCTTGTGCGAAATGTCATATGTTTACGGAGACACACAGCAGATTTC  
CATACATCAATAGAGTTTCAGGATTCCTGTAACCCGCCATTTTGCCAAATGGAAGTTGACGAGGTGGAGACACGCAGA  
ACTACTCTCGGTTGTCAGCCGATGTACACATTATCTGAACAGGAGATATGAGGGCTTTGTCATGAGCACTTCTCGGT  
TAAAAAGTCTGTTTTCGAGGAGATGGTCCGCGAGCCCGGTGATCAATCCGATCTCAAAACCTTGCATGGCAAGATCC  
TGACTTTTACCCAATCGGATAAAGAAGCTCTGCTTTCAAGAGGGTATTAGATGTTTCACTGTGATGAAGTGCAAGGC  
GAGACATACTCTGATGTTTCACTAGTTAGGTTAACCCCTACACCAGTCTCCATCATTTGAGGAGACAGCCACATGTTTT  
GGTCGCATTGTCAAGGCACACCTGTTGCTCAAGTACTACACTGTTGTTATGGATCCTTTAGTTAGTATCATTAGAGATC  
TAGAGAACTTAGCTCGTACTTGTAGATATGTATAAGGTGATGCGAGGAACACAATAGCAATTACAGATTGACTCGGTG  
TTCAAAGGTTCCAATCTTTTGTGTCAGCGCCAAAGACTGGTGATATTCTGATATGAGTTTACTATGATAAGTGCT  
CCCAGGCAACAGCACCATGATGAATAATTTGATGCTGTTACCATGAGGTTGACTGACATTTCAATTGAATGTCAAAGATT  
GCATATTGGATATGCTAAGTCTGTTGCTGCGCCTAAGGATCAAATCAAACCACTAATACCTATGGTACGAACGGCGGCA  
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CTCGCAGATTTTGATTTTGTAGATTGCGCAGGTTGATCAGTACAGACACATGATTAAAGCACAAACCAAGCAAAAAT  
GGACACTTCAATCCAAACGAGTACCCGGCTTTGCGACGATTTGTGTACCATTCAAAAAAGATCAATGCAATATTGGCC  
CGTTGTTTGTAGTACTTAGGCAATTAAGGACAGTGTGATTCGAGCAGATTTTGTGTTTTCACAAAGAAAGACACCA  
GCGCAGATTGAGGATTTCTTCGGAGATCTCGACAGTCTATGTCCGATGGATGTCTTGAGCTGGATATATCAAATACGA

## FIG. 12-2

CAAAATCTCAGAATGAATTCACCTGTGCAGTAGAATACGAGATCTGGCGAAGATTGGGTTTGAAGACTTCTTGGGAGAAG  
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AGCGGGGACGTCACGACGTTTATTGGAACACTGTGATCATTGCTGCATGTTTGGCCTCGATGCTTCCGATGGAGAAAAT  
AATCAAAGGAGCCTTTTGGCGGTGACGATAGTCTGCTGTACTTTCCAAAGGGTTGTGAGTTTCCGGATGTGCAACACTCCG  
CGAATCTTATGTGGAATTTTGAAGCAAACTGTTTAAAAAACAGTATGGATACTTTTGGCGAAGATATGTAATACATCAC  
GACAGAGGATGCATTTGTGTATTACGATCCCTAAAGTTGATCTCGAAACTTGGTGCTAAACACATCAAGGATTGGGAACA  
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TGGAGAAGATCTTACCGTCGATGTTTACCCCTGTAAAGAGTGTTTATGTGTTCCAAAGTTGATAAAAATATGGTTTCATGAG  
AATGAGTCATTGTGAGAGGTGAACCTTCTTAAAGGAGTTAAGCTTATTGATAGTGGATACGTCGTTTAGCCGGTTTGGT  
CGTCACGGGCGAGTGGAACCTTGCTGACAAATTGACAGAGAGGTGTGAGCGTGTGCTGTTGGTGAACAAAAGGATGGAAGAG  
CCGACGAGGCCACTCTCGGATCTTACTACACAGCAGCTGCAAGAAAAGATTTCAAGTTCAAGGTCGTTCCCAATTATGCT  
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TCCGCTTTCTCTGGAGTTTGTGTCGGTGTGTTTGTATTATAGAAATAATAAAAATTAGGTTTGGAGAGAGAAGATTACAA  
ACGTGAGAGACGGAGGGCCCATGGAACCTTACAGAGAAGTCTGTTGATGAGTTTCAAGAGATGTCCTTATGTGATCAGG  
CTTGCAGAGTTTTCGATCTCGAACCGGAAAAAGAGTGTGTCGCAAGGGGAAAAATAGTAGTAATGATCGGTCAGTGCC  
GAACAAGAACTATAGAAATGTTAAGGATTTTGGAGGAATGAGTTTAAAAAGAATAAATTAAATCGATGATGATTCGGAGG  
CTACTGTGCGCAATCGGATTGTTTAAATAGATCTTACAGTATCACTACTCCATCTCAGTTCTGTTCTTGTCTATTAA  
TATGAGGTTGCTGAACACCATGGTGAACAAACCTTCTTGTCCCTTTCCGGTCCCTCATGTCCTCTTGGCCTCTCCTCCA  
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AACCTTGACTGCCAGGAAGAGCCAGATTCTGTCATCAGTGAGAAGCTCTTCATGGAGATGGCAGAGCTATGGTCTCAGA  
AGGCTGGAAGGATGCAGGTTATGAGTACCTCTGCATTGATGACTGTTGGATGGCTCCCAAGAGATTGAGAAGGCAGAC  
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TGCTGACTGGGAGTAGATCTGCTAAAAATTGATGGTTGTTAGTGTGACAGTTTGGAAAATTGGCAGATGGTTATAAGC  
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CCTTTATTCTATGTTAATGACCTCCGACACATCAGCCCTCAAGCCAAAGCTCCTTTCAGGATAAGGACGTAATGGCAT  
CAATCAGGACCCCTTGGGCAAGCAAGGGTACCAGCTTAGACAGGGAGACAACCTTGAAGTGTGGGAACGACCTCTCTCAG  
GCTTAGCCTGGGCTGTAGCTATGATAAACCGGCAGGAGATTGGTGGACCTCGCTCTTATACCATCGCAGTTGCTTCCCTG  
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GCAGAGTCCGACAACAGCTGAACGTTAGATGCTACCCGAGGGTAGACGACGCTACGGTTGCAATTCGGTCTGCTATAA  
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CCCTGATAAATGCTTCAATAATATTGAAAAAGGAGATATGAGTATTCACATTTCCGTGTGCGCCTTATTCCTTTT  
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GAGTGGGTTTCAAGCTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTCCAATGATG  
AGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTGTGACGCCGGGAAGAGCAACTCGGTGCGCCGATACA  
CTATTCTCAGAATGACTTGGTTGAGTACTACCAAGTCACAGAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTAT

## FIG. 12-3

GCAGTGTGCCATAACCATGAGTGATAAACTGCGGCCAACTTACTTCTGACAAACGATCGGAGGACCGAAGGAGCTAACC  
GCTTTTTTGCACAACATGGGGGATCATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAACGA  
CGAGCGTGACACCACGATGCTGACGAAATGGCAACAACGTTGCGCAAACTATTAACCTGGCGAACTACTTACTCTAGCTT  
CCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGG  
TTTATTGCTGATAAATCTGGAGCCGCTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTC  
CCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCT  
CACTGATTAAGCATTGGTAACTGTACAGCAAGTTTACTCATATATACCTTTAGATTGATTAAAACTTCATTTTTAATTT  
AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCTGTTCCACTGAGCGTC  
AGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAC  
CACCGCTACCAGCGGTGGTTTGTGTCGCGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCG  
CAGATACCAATACTGCTCTTAGTGTCGCTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCT  
CGCTCTGCTAATCCTGTTACAGTGGCTGCTGCCAGTGGCGATAAGTCGTGCTTACCGGGTTGGACTCAAGACGATAGT  
TACCGGATAAGGCGCAGCGTTCGGCTGAACGGGGGGTTCGTGCACACAGCCAGCTTGGAGCGAACGACCTACACCGAA  
CTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCGAAGGGAGAAAGCGGACAGGTATCCGGTAAGCGG  
CAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGAAACGCTGCTATCTTTATAGTCTGTGCGGGTTTCGCC  
ACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAACGCGCAGCAACGCGGCCCTT  
TTACGGTTCCTGGCCTTTTGTGCTGCTTGTCTCACATGTTCTTCTGCGTTATCCCTGATTCTGTGGATAACCGTAT  
TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGACGCGAAGCGAGCGAGCGAGTCAGTGAGCGAGGAGCGGAAG  
AGCGCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTTACACCGCATATGGTGCCTCTCAGTACAATCTGC  
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ACACCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTG  
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ATTACAGATGTCTGCTGTTTATCCGCTGCCAGCTCGTTGAGTTTCTCCAGAAGCGTTAATGTCTGGCTTCTGATAAAG  
CGGGCCATGTTAAGGGCGGTTTTTCTCTGTTTGGTCACTTGATGCCTCCGTGTAAGGGGGAATTTCTGTTTATGGGGTA  
ATGATACCGATGAACGAGAGAGGATGCTACGATACGGGTACTGATGATGAACATGCCCGGTTACTGGAACGTTGTGA  
GGGTAACAACTGGCGGTATGGATGCGGCGGGACAGAGAAAATCACTCAGGGTCAATGCCAGCGTTCTGTTAATACAG  
ATGTAGGTGTTCCACAGGGTAGCCAGCAGCATCTGCGATGCAGATCCGGAACATAATGGTGCAGGGCGCTGACTTCCGC  
GTTTCCAGACTTTACGAAACACGAAACCGAAGACCATCATGTTGTTGCTCAGGTGCGAGACGTTTTGACAGCAGCAGTC  
GCTTCAGCTTCGCTCGGTATCGGTGATTCATTCTGCTAACAGTAAGGCAACCCCGCAGCTAGCCGGGTCCTCAACG  
ACAGGAGCAGATCATGCGACCCGTCGCGCAGGACCAACGCTGCCGAGATGCGCGCGTGCCTGCTGGAGATGGCG  
GACGCGATGGATATGTTCTGCCAAGGGTTGGTTTGCAGATTACAGTTCTCCGCAAGAATTGATTGGCTCCAATTTCTGG  
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GGGAGGCGAGACAAGGTATAGGGCGGCGCTACAATCCATGCCAACCCGTTCCATGTGCTCGCCGAGGCGGATAAATCG  
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## FIG. 13-1

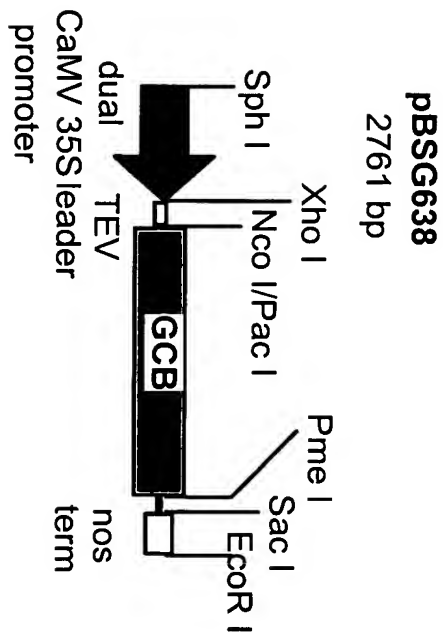
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CGAGAGAAATCCTCTTGGGATTCATCATCAGTCAATTACTGGTTTTCCCAAAATGAGGGATATGGTCATCGTACCATTAT  
TCGACATTTCTTTGGAGACTAGTAAGAGGACGCGCAAGGAAGTCTTAGTGTCGAAGGATTTCGTGTTACAGTGTCAAC  
CACATTCGAACATACCAGGCGAAAGCTCTTACATACGCAATGTTTTGTCCTTCGTGCAATCGATTTCGATCGAGGGTAAT  
CATTAACGGTGTGACAGCGAGGTCCGAATGGGATGTGGACAATCTTTGTTACAATCCTTGTCCATGACGTTTTACTTGC  
ATACTAAGCTTGGCGTTTGAAGGATGACTTACTGATTAGCAAGTTAGTCTCGGTTCCGAAACGGTGTGCCAGCATGTG  
TGGGATGAGATTTCGCTGGCGTTTGGGAACGCATTTCCCTCCGTGAAAGAGAGGCTCTTGAAACAGGAACTTATCAGAGT  
GGCAGGCGACGCATTAGAGATCAGGGTGCCTGATCTATATGTGACCTTCACGACAGATTAGTGACTGAGTACAAGGCCT  
CTGTGGACATGCTGCGCTTGACATTAGGAAGAAGTGAAGAAGACGGAAGTGTATGCAATGCATTTTGAATATATCG  
GTGTTAAGGGAGTCTGACAAATTCGATGTTGATGTTTTTCCAGATGTGCCAATCTTTGGAAGTTGACCAATGACGGC  
AGCGAAGGTTATAGTTCGCGGTATGAGCAATGAGAGCGGTCTGACTCTCACATTTGAACGACCTACTGAGCGAATGTTG  
CGTAGCTTTACAGGATCAAGAGAAGGCTTCAGAAGGTGCATTGGTAGTTACCTCAAGAGAAGTTGAAGAACCGTCCATG  
AAGGGTTTCGATGGCCAGAGGAGAGTTACAATTAGCTGGTCTTGCTGGAGATCATCCGGAATCGTCTTATTCTAAGAACGA  
GGAGATAGAGTCTTTAGAGCAGTTTCATATGGCGACGCGAGATTCTGTTAATTCGTAAGCAGATGAGCTCGATTGTGTACA  
CGGGTCCGATTAAAGTTTCAGCAATGAAAACTTTATCGATAGCCTGGTAGCATCACTATCTGCTGCGGTGTCAGATCTC  
GTCAAGATCCTCAAAGATACAGCTGCTATTGACCTTGAACCCGTCAAAAGTTTGGAGTCTTGGATGTTGCATCTAGGAA  
GTGGTTAATCAAACCAACGGCCAAAGAGTCAATGATGGGGTGTGTTGAAACCCACGCGAGGGAGTATCATGTGGCGCTTT  
TGGAATATGATGAGCAGGGTGTGGTGACATGCGATGATTGGAGAAGAGTAGCTGTTAGCTCTGAGTCTGTTGTTTATTCC  
GCATCTCCGATAAAGTTTCAGCAATGCGCAGACTGCTTCGAAACGAGAGAACCGCATGTCACTAGCGCAAAGGTTGTTCTTGT  
GGACGGAGTTCGGGGCTGTGGAAAAACCAAGAAATCTTTCCAGGGTTAATTTTGATGAAGATCTAATTTTAGTACCTG  
GGAAGCAAGCCCGGAAATGATCAGAAGACGTGCGAATTCCTCAGGGATTATTGTGGCCACGAAGGACAACGTTAAACC  
GTTGATCTTTTCATGATGAATTTTGGGAAAAGCACACGCTGTCACTTCAAGAGGTTATTTCATTGATGAAGGGTTGATGTT  
GCATACTGGTTGTGTTAATTTCTTGTGGCGATGTCACTTGTGCGAAATTGCATATGTTTACGGAGACACACAGCAGATTC  
CATACATCAATAGAGTTTCAGGATTCCTGATACCCCGCCCATTTTGCCAAATTGGAAGTTGACGAGGTGGAGACACGCA  
ACTACTCTCCGTTGTCCAGCCGATGTACACATTATCTGAACAGGAGATATGAGGGCTTTGTCTATGAGCACTTCTTCCGT  
TAAAAAGTCTGTTTCGAGGAGATGGTCCGCGGAGCCCGGTGATCAATCCGATCTCAAACCCCTGTCATGGCAAGATCC  
TGACTTTTACCCAATCGGATAAAGAAGCTCTGCTTTCAAGAGGTTATTCAGATGTTTCACTGTGCATGAAGTGAAGGC  
GAGACATACTCTGATGTTTCACTAGTTAGGTTAACCCTTACACCGGTCTCCATCATTGCAGGAGACAGCCCATGTTTT  
GGTCGATTTGTCAAGGCACACCTGTTGCTCAAGTACTACACTGTTGTTATGGATCCTTTAGTTAGTATCATTAGAGATC  
TAGAGAACTTAGCTCGTACTTGTAGATATGTATAAGGTGATGACAGGAACACAATAGCAATTACAGATTGACTCGGTG  
TTCAAAGGTTTCAATCTTTTGTGTCAGCGCAAGACTGGTGATATTTCTGATATGCAGTTTTACTATGATAAGTGTCT  
CCCAGGCAACAGCACCATGATGAATAATTTTGTGCTGTTTACCATGAGGTGACTGACATTTTATTGAATGTCAAAGATT  
GCATATGGATATGTCTAAGTCTGTTGCTGCACCTAAGGATCAATCAAACCACTAATACCTATGGTACGAACGGCGGCA  
GAAATGCCACGCCAGACTGGACTATTGGAATAATTTAGTGGCGATGATTAAGAGAACTTTAACGCACCCGAGTTGTCTGG  
CATCATTTGATATTGAAAATACTGCATCTTTGGTTGTAGATAAGTTTGTGATAGTTATTGCTTAAAGAAAAAGAAAC  
CAAATAAAAAATGTTTTCTTTGTCAGTAGAGAGTCTCTCAATAGATGGTTAGAAAAGCAGGAACAGGTAACAATAGGCCAG  
CTCGCAGATTTTGTATTTGTGGATTGTCAGCAGTTGATCAGTACAGACACATGATTAAAGCACAACCCAAACAAAAGTT  
GGACACTTCAATCAAACGGAGTACCCGGCTTTGAGACGATTGTGTACCAATCAAAGAGATCAATGCAATATTCGGCC  
CGTTGTTTAGTGAGCTTACTAGGCAATTACTGGACAGTGTGATTCGAGCAGATTTTGTGTTTTTCAAGAAAGACACCA  
CGCAGATTGAGGATTTCTTCGAGATCTCGACAGTCAATGTCGCGATGATGTTTGGAGCTGGATATATCAAATACGA

**FIG. 13-2**

CAATCTCAGATGAATCCACTGTGCAGTAGAATACGAGATCTGGCGAAGATTGGGTTTCGAAGACTTCTTTGGGAGAAAG  
TTTGGAAACAAGGGGCATAGAAAAGACCACCCTCAAGGATTATACCGCAGGTATAAAAACCTTGCATCTGGTATCAAGAAAG  
AGCGGGAGCGCTCAGCAGCTTCATTGGAAGAACTGTGATCATTTGCTGTCATGTTTGGCCCTCGATGCTCCGATGAGAGAAAAT  
AATCAAAGAGGCTTTTTCGGTGCAGATAGTCTGCTGACTTTCCAAAGGCTTGTGAGTTTCCGGATGCGCAACACTCCG  
CGAATCTTATGTGGAATTTTGAAGCAAAACTGTTTAAAAAACAGTATGGTACTTTTTCGGAAGATATGTAATACATCAG  
GACAGAGGATGCTATTGTGTATTACGATCCCTAAAGTTGATCTCGAACTTGGTGCTAAACACATCAAGGATTGGGAACA  
CTTGGAGGAGTTCAGAAGGCTCTTTTGTGATGTTGCTGTTTCGTTGAAACAAATGTCGCTATTACACAGCTTTGGACAGCG  
CTGTATGGGAGTTTCATAAGACCGCCCTCCAGTTTCGTTTGTGTTTATAAAAGTCTGGTAGAATTTTGTCTGATAAAGTT  
CTTTTTAGAAGTTTGTTTATAGATGGCTCTAGTTGTTAAGGAAAAAGTAAATCAATGAGTTTATCGACCTTGACAAAA  
TGAGAGAAGATCTTACCGTCGATGTTTACCCTGTAAAGAGTGTATTGTGTCCAAAGTTGATAAAATAATGGTTCATGAG  
AATGAGTCATTTGTCAGGGGTGAACCTTCTTAAAGAGATTAAAGCTTATTGATAGTGGATACGTCGTTTTCAGCCGTTTGGT  
CGTCACGGGCGAGTGAACCTTGCTGACAAATGCGAGGAGGTTGAGCGTGTGCTCGGTGGACAAAAGGATGGAAAGAG  
CCGACGAGGCCATTCTCGGATCTTACTACACGAGCTGCAAGAAAGAAATTCAGTTCAAGTTCGTTCCCAATTATGCT  
ATAACCAACCAGGACGCGATGAGAAACGCTCTGGCAAGTTTATGTTAATATTAGAAATGTGAAGATGTCAGCGGGTTTCTG  
TCCGCTTTCTCTGGAGTTTGTGTCCGTGTGTATTGTTTATAGAAATAATATAAAATTAGGTTTGAGAGAGAAGATTACAA  
ACGTGAGAGACGGAGGGCCCTAGGAATCTACAGAAAGATCGTTGATGAGTTCTAGGAAGTTCCTATGTTCGATCAGG  
CTTGCAAAAGTTTCGATCTCGAACCGGAAAAAGAGTGATGTCGCAAGGGAAAAATAGTAGTAGTATCGTTCAGTGGCC  
GAACAAGAACTATAGAAATGTTAAGGATTTTGGAGGAATGAGTTTAAAAAGAAATAATTTAATCGATGATGATTCGGAGG  
CTACTGTCGCCGAATCGGATTGTTTTAAATAGATCTTACAGTATCACTACTCCATCTCAGTTCGTGTCTTGTCTaat  
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caaccttgactgccaggaagagccagattcctgcatcagtgagaagctcttcattggagatggcagagctcatggtctcag  
aaggctggaaggatcgaggttatgagtagacctctgcattgatgactggtggatggctcccaaaagagattcagaaggcaga  
cttcaggcagacctcagcgcttccctcatgggattcggcagctagctaatattgttcacagcaaaaggactgaagctagg  
gattatcgagatgttggaaaataaaactctgcgaggcttccctgggagtttggatactacgacatctgatgccagacct  
ctgctgactggggagtagatctgctaaaaatttgatggttgtaactctgtgacagtttggaaaaatttggcagatgggtataag  
cacatgtccttggccctgaataggactggcagaagcatttgttactcctgtgagtgccctcttctatgtggcccttca  
aaagcccaattatcacagaaatccgacgtagtctgaatcaactcggcgaatttggctgacatgatgatctctggaaaagta  
taagagtatcttggactgggacatctttaaaccgagagaagaattgttgatgttgaggaccagggggttggaaagccca  
gatattgttagtgattggcaacttggccctcagctggaatcagcaagtaactcagatggccctctgggctcatctaggtctg  
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tcaatcaggaccccttgggcaagcaagggtaccagcttagacagggagacaacttgaagtggtgggaacgacctctctca  
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ggacttcaagggttaagaagtcacataaatcccacaggcactgttttgcttcagctatctgaaaaggacgaattatgacct  
aggGGGTAGTCAAGATGCATAATAATAACGGATTGTGTGGCTTAATCACAGCTGGTGCATGATACGATAGTGTGTTT  
TCCCTCCACTTAAATCGAAGGGTTGTGCTTTGGATCGCGCGGTCAAATGTATATGTTTCATATACATCCGACGGCAGGT  
AATAAAGCGAGGGGTTCCGGTCGAGGTCCGCTGTGAACTCGAAAAGGTTCCGAAAAACAAAAAGAGAGTGGTAGGTAA  
TAGTGTTAATTAAGAAAAATAAATAATAGTGGTAAGAAAGGTTTGAAGTTGAGGAAATTGAGGATAATGTAAGTGATG  
ACGAGTCTATCGCTCATCGATGACTGCTTTAATCAATATGCTTATACAACTCAACTCTCCGAGCCAAATTTGTTACTTAA  
GTTCCGCTTTATGCAGATCTGTGCAGCTGATCAACTCTGTGACAAATGTCATGGGTACCTTGGGTAACCGATTTCAAACGCAACAGCT  
AGGACAACAGTCCACAGCAATTTGCGGATGCCTGGAAACCTGTGCCTAGTATGACAGTGAGATTTCTGCATCGGATTT  
CTATGTGTATAGATATAATTTCGACGCTTGATCCGTTGATCACGGCGTTATTAAATAGCTTCGATACTAGAAATAGAATAA  
TAGAGGTTGATAATCAACCCGACCCGAATACTACTGAATCGTTAACCGCATCAGAGGGGTAGACGATCGCATGCTAGCT  
ATAAGGGCTTCAATCAATAATTTGGCTAATGACTGGTTCGTGGAACCTGGCaTGTTCAACTCAAGCAAGCTTTGAGACTGC  
TAGTGGACTTGTCTGGACCAACTCCGCTACTTAGTctattgtgtgagatttctcaaaaataagctcactgaagactta  
aaattcaggggtggctgataccaaaaatcagcagtggtgtgtctgctccactaaatataacgatttgtcatatctggatccaac  
agttaaacccatgtatggtgtatctgtggtatggcgttaaaacaacggaaaagtcgctgaagacttaaaattcaggggtg  
ctgatccaaaaatcagcagtggtgtgtgtgctccactaaaaataaacgatgtcatatctggatccaacgatttaaacgatg  
gatggtgtatactgtggtatggcgttaaaacaacggagaaggttgcattctccctaacccqcgqgtacgcqccca

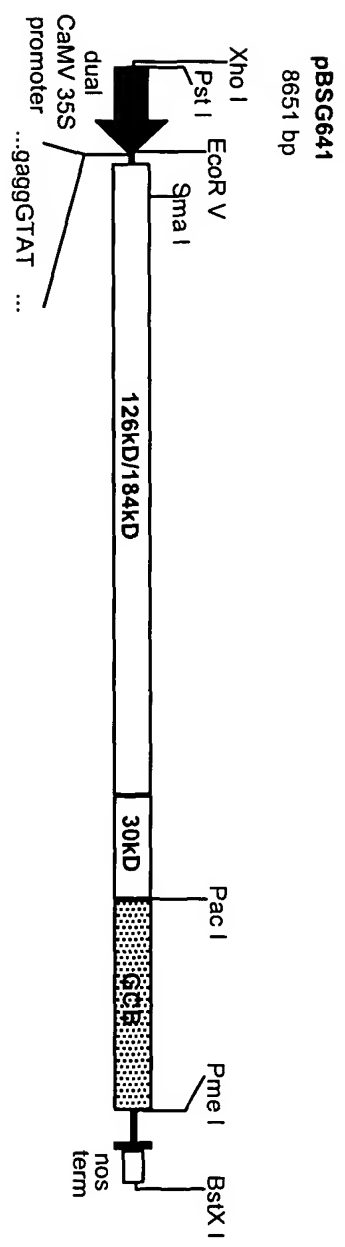


TRANSGENIC VECTOR FOR rGCB EXPRESSION



**FIG. 14**

# VIRAL VECTOR FOR rGCB EXPRESSION



**FIG. 15**